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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,363	04/16/2004	Han Sang Lee	8733.1030.00-US	8107
30827 7590 05/05/2011 MCKENNA LONG & ALDRIDGE LLP 1900 K STREET, NW WASHINGTON, DC 20006				
EXAMINER WALTHALL, ALLISON N				
ART UNIT		PAPER NUMBER		
2629				
MAIL DATE		DELIVERY MODE		
05/05/2011		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/825,363

**Applicant(s)**

LEE ET AL.

**Examiner**

ALLISON WALTHALL

**Art Unit**

2629

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 April 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 7-11 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 7-11, 16-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 27, 2011 has been entered. Claims 1, 7-11, and 16-19 are pending.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 7-11, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida (US Publication 2001/0026283) in view of Naito (US Patent 6,462,735), Chen (US Patent 6,972,772), Mizukoshi (US Patent 6,919,691), and Endou (US Patent 7,158,156).

As to **claim 1**, Yoshida discloses a display device comprising:

R, G and B cells having different light-emission efficiencies (i.e. V-T characteristics, see Figs 10b-d and [0090-0091]),

a timing controller (fig 1) for generating a gate control signal (H) and a data control signal (V), wherein the timing controller includes a R look-up table (18; see Fig 2a) which receives Red N-bit digital data signals (8 bit) and converts the Red N-bit digital data signals into Red M-bit digital data signals (10 bit), a G look-up table which receives Green N-bit digital data signals and converts the Green N-bit digital data signals into Green M-bit digital data signals, and a B look-up table which receives Blue N-bit digital data signals and converts the Blue N-bit digital data signals into Blue M-bit digital data signals (see Figs 10b-d and [0084-0085] and [0090, 0091, and 0095]), wherein each of N and M is an integer, and M is greater than N ( $M > N$ ).

Yoshida does not specifically disclose a gamma voltage generator having a single resistor string in which a plurality of resistors are serially connected, which receives all of the Red, Green, and Blue M-bit digital data signals and generates a plurality of gamma voltages corresponding to the Red, Green, and Blue M-bit digital data signals and a data driving circuit which generates Red, Green, and Blue analog data signals corresponding to the plurality of gamma voltages responding to the data control signal; and wherein each of the R, G, and B cells has a cathode electrode, an anode electrode, and an emitting layer interposed between the cathode electrode and the anode electrode; and numbers of gray scale values of the Red, Green, and Blue N-bit digital data signals are the same, and wherein a number of gray scale values of the Red M-bit digital data signals is larger than that of the Green M-bit digital data signals, and a number of gray scale values of the Green M-bit digital data signals is larger than

that of the Blue M-bit digital data signals. Yoshida teaches an LCD instead of an electro-luminescent display.

Naito teaches a similar bit conversion (see column 11, lines 16-23) that is applicable to both LCDs and electro-luminescent displays (see column 17, lines 16-23). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the technique taught by Yoshida to a similar EL display device in the same way--correcting for the different lighting characteristics of red, green, and blue.

Chen teaches numbers of gray scale values of the Red, Green, and Blue N-bit digital data signals (i.e. input value) are the same, (see Fig 2) and wherein a number of gray scale values of the Red M-bit (i.e. output value) digital data signals (line 103) is larger than that of the Green M-bit digital data signals (line 105), and a number of gray scale values of the Green M-bit digital data signals is larger than that of the Blue M-bit digital data signals (line 107). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a number of gray scale values of red larger than green, and green larger than blue, in order to generate a target white point (see Chen column 3, lines 44-51).

Mizukoshi teaches an electroluminescent display device wherein each of Red, Green, and Blue pixels includes a cell which has a cathode electrode, an anode electrode and an emitting layer disposed between the cathode electrode and the anode electrode (see column 1, lines 22-51 and column 4, lines 17-28). It would have been obvious to one having ordinary skill in the art at the time the invention was made to

include the cells with a cathode electrode, emitting layer, and anode electrode as taught by Mizukoshi, in the display of Yoshida as modified by Chen, in order to provide self luminous pixels.

Endou teaches a gamma voltage generator (Fig 8) having a single resistor string (21) in which a plurality of resistors (R) are serially connected, which receives all of the Red, Green and Blue M-bit digital data signals and generates a plurality of gamma voltages corresponding to the Red (Vr0-15), Green (Vg0-15) and Blue M-bit digital data signals (Vb0-15) (see column 5, lines 9-67 and Fig 9); and

a data driving circuit which generates Red, Green and Blue analog data signals corresponding to the plurality of gamma voltages (via DACs 12-14) responding to the data control signal, and supplies the Red, Green and Blue analog data signals to respective Red, Green and Blue pixels (see column 6, lines 34-48).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the gamma voltage generator of Endou in the display of Yoshida as modified by Chen and Mizukoshi, in order to reduce the number of resistor strings and power supplies (see Endou, column 5, lines 60-67).

**Claim 11** is analyzed similar to claim 1.

As to **claim 7**, Naito teaches wherein the Red analog video signal applied to the respective pixel has a voltage level ranged in 0V to 5V (Fig 3 and see col. 10, lines 50-52).

As to **claim 8**, Naito teaches wherein the Green analog video signal applied to the respective pixel has a voltage level ranged in 0V to 2.5V (see Fig. 3 and col. 10, lines 50-52).

As to **claim 9**, Naito teaches wherein the Blue analog video signal applied to the respective pixel has a voltage level ranged in 0V to 1.9V (see Fig. 3 and col. 10, lines 50-52).

As to **claim 10**, Naito teaches an electroluminescence display (see column 17, lines 16-23), thus it is obvious each of the pixels is an electro-luminescence cell.

**Claims 16-19** are analyzed similar to claims 7-10.

#### ***Response to Arguments***

4. Applicant's arguments with respect to claims 1 and 11 have been considered but are moot in view of the new ground(s) of rejection. In view of amendments, the references of Yoshida and Endou have been added for new grounds of rejection.

#### ***Inquiry***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALLISON WALTHALL whose telephone number is (571)270-3571. The examiner can normally be reached on Mon-Fri 9:30-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on (571)272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

anw  
April 28, 2011

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